Tech In The News
Assignment: Uber Taxis

Headphones Needed: ☒ YES ☐ NO

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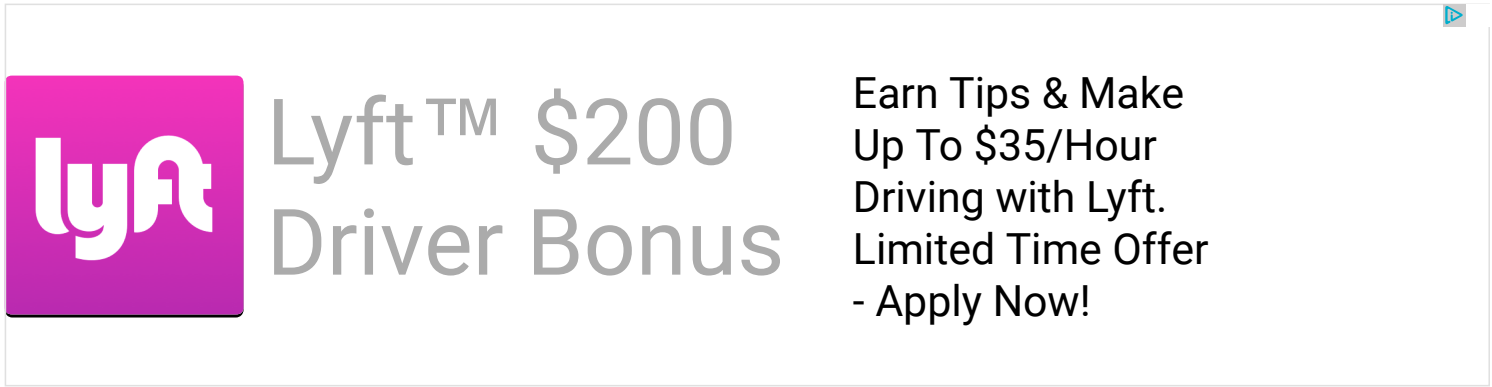
Step Three:

With your partner, create a Word Document, list the five (5) W of the story.
If there are hyperlinks, go to them and review.
Five (5) Advantages of the flying taxis program.
Five (5) Disadvantage of the flying taxis program.

Submit Your Assignment :	UberFlyingTaxis_Yournames
To Mr. Amerikaner Using:	GDrive



URBAN TRANSPORT

Elevate: Uber plans to add 170-mph VTOL flying taxis to its on-demand transport mix

Loz Blain | 10 hours ago

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Uber Elevate could see air taxi leave a vertiport built into the top of an urban parking garage (Credit: Uber)

VIEW GALLERY - 10 IMAGES

Uber has profoundly disrupted the taxi business with its ride sharing model, and has made it clear it wants to be a key player in future autonomous taxi services. Now, it's released a fantastic 97-page white paper detailing exactly how it wants to integrate electric VTOL multirotor air taxis into its mid-range transport system.

The full document makes fantastic reading for the future-focused. In it Uber leaves no doubt that it believes electric air taxis will be viable, safe and in many cases, both faster and cheaper than cars over a certain distance. Here's a summary of the points we found most interesting.

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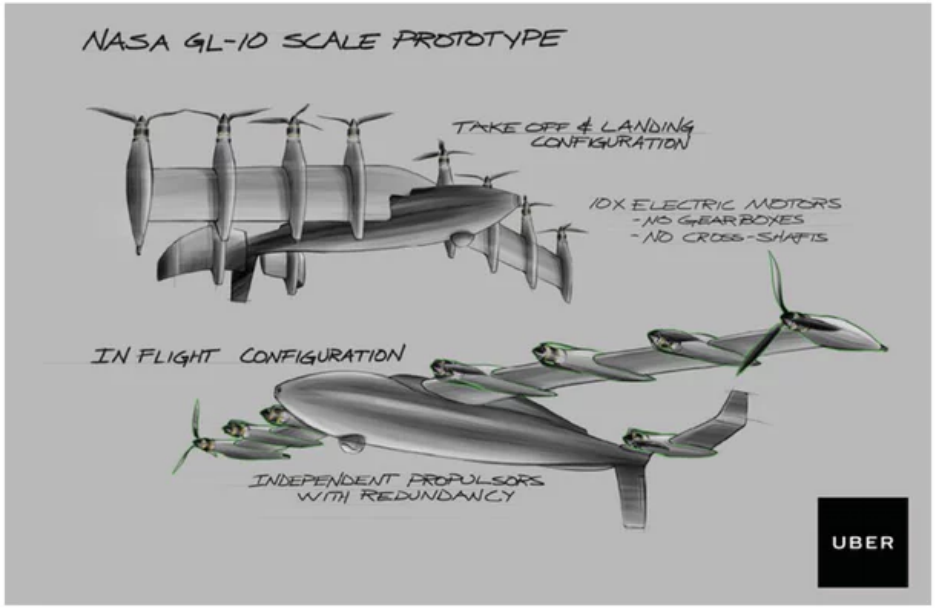
What will VTOL air taxis look like?

In order to meet the key goals of the Uber Elevate program (safety, efficiency, low cost, minimal noise and disruption, minimal infrastructure) the team has zeroed in on some highly likely design parameters.

Firstly, they'll be electric multirotors, using multiple small rotors instead of a single larger one like a helicopter. This helps keep the noise down (Uber is hoping for around 67 dB at a 250-ft (76-m) altitude, which is around the level of a normal spoken conversation), but multiple rotors also increase stability, ride comfort and redundancy in case of motor failure, not to mention the ability to deal with unbalanced loads like having a passenger on one side and an empty seat on the other.



Secondly, they'll have between two and four seats - current charter flights at the moment are taking an average of between 1.3-1.7 passengers, and even 100-mile (62 km) car trips have an average of 1.3 people in them. These aircraft don't need to be huge.

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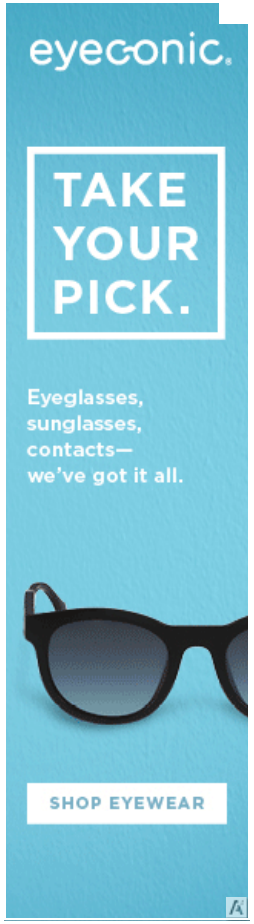
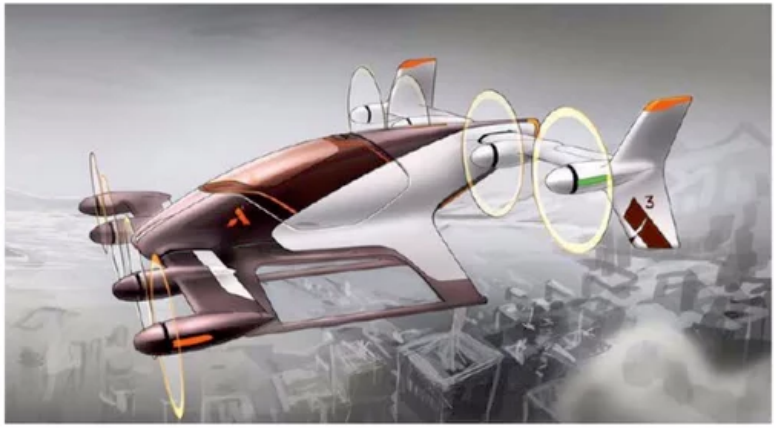
Newly discovered asteroid gives Earth a near miss



Thirdly, while Uber sees VTOL as an imperative part of the service, the aircraft will most likely convert to some sort of cruise mode once they're aloft. Tilt wings and tilting rotors along a wing could both achieve this sort of effect, vastly reducing the energy requirements as the aircraft cover distance.

That rules out manned drone-style aircraft like the Volocopter or eHang. Uber is looking at something much more like the mysterious Zee.Aero design, Nasa's GL-10 prototype, or the S2 and S4 designs Joby Aviation is working on.

Joby
S2



Airbus A3
Vahana

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Review: PowerUp FPV drone looks good, on paper

A quick aside; I've visited the extraordinary Joby Aviation compound and seen the full and quarter size aircraft under construction. Things have come a long way from the video the team released a couple of years ago - and for those who have said it's a pie-in-the-sky CAD concept that'll never get off the ground, so to speak, I can tell you without breaking my non-disclosure agreement that this machine is absolutely happening, and it looks amazing. Recent spy photos show that Larry Page's Zee.Aero machine is even further along, with what appears to be a full scale prototype built, and perhaps flying.

Uber's air taxis will likely have a cruise speed between 150 and 200 mph (240 and 400 km/h), which is where electric propulsion finds its peak efficiency. They will likely fly below 10,000 ft (3,000 m). A four-person aircraft will require a battery of around 140 kWh, with the battery itself weighing in around 400 Watt-hours/kg in order to satisfy Uber's initial use case target: two 50-mile (80-km) flights, with vertical takeoff and landing, and a 30-minute power reserve - all while never dipping below 20 percent battery in order to maximize battery lifespan.

With cruise being so much more efficient than the VTOL part of an operation, those numbers should give the air taxis a maximum single-trip range of around 200 mi (322 km).

Uber sees these machines as being completely autonomous in the long term, with a team of remote pilots sitting at central office locations ready to take over the controls in case of an emergency. In the initial stages, they'll be piloted and the pilots will require commercial pilot's licenses with at least 500 hours of pilot-in-command experience. But the company believes that as autonomous measures begin to take over more and more of the flight, pilot qualification could be greatly streamlined.

Weather is going to be an unsolvable issue. If the weather gets bad enough, these things will need to pull out of their current trips and find the closest spot to land and wait it out, or put the passengers into a ground based transport service to get them to their destinations as fast as possible.

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Coachbuilt Speedback GT flashes some patriotism

What ground infrastructure will there be?

The air taxis will not be flying you door-to-door like some sort of flying car - at least, not in the initial plan. Uber plans to build a series of "vertiports" and "vertistops" throughout each city it rolls out in.

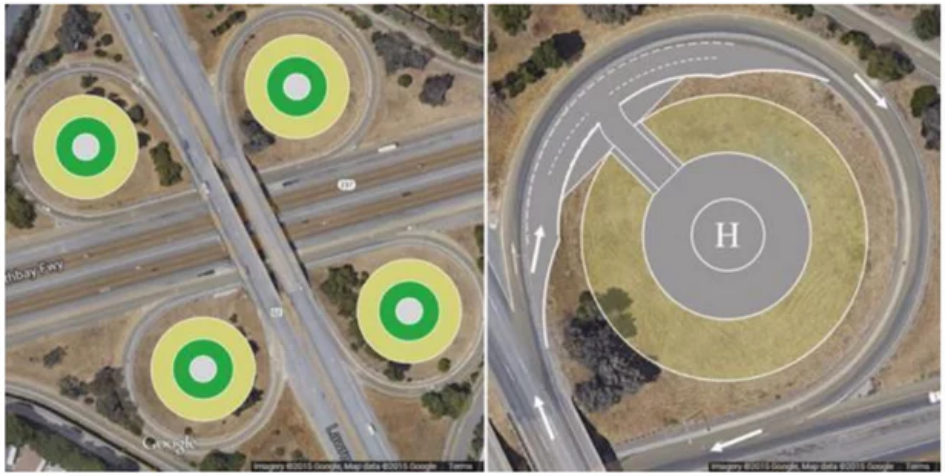
Vertiports will be large spaces capable of keeping around a dozen VTOL aircraft, as well as charging infrastructure, support and basic maintenance services. Uber sees opportunities to use floating barges for these where rivers, lakes and bay areas are available, but other spots could include the top levels of multi-story carparks, or ground facilities in less populated areas.

Tesla's solar roof solution hides in plain sight

Joby's wild 16-rotor convertible aircraft for long-range, high-speed, electric VTOL commuting

13-inch MacBook Pro (2016) vs. Microsoft Surface Book

Vertistops are quick pick-up/drop-off points requiring no charging or support infrastructure, much like a basic helipad. There are plenty of existing helipads about, many of which are disused or restricted for very rare private usage, and Uber is looking at utilizing these where practical. But one other interesting idea proposed by NASA involves building vertistops within the radius of highway cloverleaf on- and off-ramps, which in many areas are big enough to make for a perfect vertistop space with a generous safety buffer zone and instant car access to the freeway once you're landed.



Location will be critical as the aircraft need to be able to approach the vertiports and vertistops without overflying private property at less than 500 ft (152 m) - this is another point in favour of the cloverleaf designs, as the VTOL aircraft could approach the landing points directly over the freeway's public land.

Not to mention, it's important that vertistops and ports integrate well with other modes of transport, be they mass transit solutions like London's tube network, or simply good access to roads where you can continue your journey in an UberX.

Uber sees great opportunity in transport between airports as well - particularly in cities like London, where a trip from Heathrow to Gatwick could be reduced from 90

Prototype system replaces stairs and elevators with human power

Shot of nitrous propels Hyundai Ioniq hybrid to land speed record at Bonneville

Kia rocks, skis, triathlons and takes care of business at SEMA 2016

First look: New MacBook Pro without Touch Bar is still a sweet upgrade

minutes to 10 - and space at the airports themselves would serve as the perfect vertiports.

Another area that needs to be considered is airspace management in a much more crowded sky. Implementing VTOL air taxis at scale would massively increase the amount of vehicles in the sky at a given time, especially if other concepts like drone delivery take off as well. Uber is considering how high bandwidth real time non-verbal communication between aircraft and ground stations might be implemented to make sure all aircraft stay a safe and prudent distance from one another.

Are the costs feasible?

In the longer term, Uber seems to think so. The costs of the aircraft themselves will be extremely high to begin with - around US$1.2 million per unit in the first instance. But Uber wants to get production levels up around 6,000 units per year, which it believes would bring vehicle costs closer to $238,000. Next-gen battery technology,

as well as mega production facilities that are coming on line, should help bring battery costs down dramatically.

Infrastructure-wise, Uber is looking at 83 initial vertiports across three or four cities, with a total cost somewhere around $121 million. And that's only the second biggest expense with maintenance set to be a larger cost per mile. Third will be pilot costs in the pre-autonomous era, followed by energy costs and vehicle capital expenditure at a distant fifth.

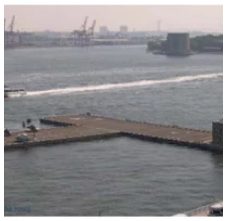
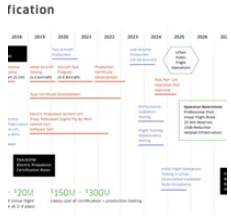
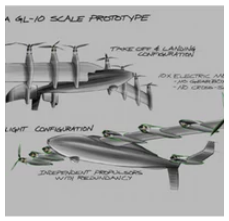
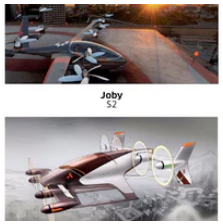
For the customer, the initial picture doesn't look terrible to begin with, but it will certainly be a premium service. Uber's projected prices start at between $2 and $3 per mile, meaning if you want to trade your choked 60-mile highway crawl for a 15-minute air taxi, you're up for $120-180. There's a lot of folks for whom that price would make sense.

Move into the high volume production, autonomous autopilot era, however, and Uber believes it can slash costs to the point where that 60-mile journey costs more like $21. At this point, it'll be much cheaper per mile than an UberX service (not to mention, since you can fly directly point to point you don't have do do nearly as many miles). Who wouldn't take the skyway?

Of course, there are a lot of obstacles in the way, many of which are regulatory. The FAA is not known for being as optimistic about new technologies as Silicon Valley startups, and Uber is aware of where the holes and roadblocks are. But again, Uber has demonstrated a clear ability to smash through red tape in the past - its entire business model started out being flat out illegal in most jurisdictions, and yet today it thrives.

And while the cost of setting up an air taxi service seems monstrous at this point, we're talking here about a company valued at some $70 billion that doesn't seem to have problems getting cash together.

As far as timelines go, Uber believes its Elevate service could make its public debut within 10 years, putting it a few years behind the autonomous car revolution.

It's hard to think of a company in a better position to deliver on such a wild, futuristic promise, either; who else is so cashed-up, future-forward and cavalier? Who else has such a grip on the current state of transport for hire? The airline companies? Jeez, I hope not. It's hard not to root for Uber on this one.

For a much fuller look at Uber Elevate, download the full 97-page white paper.